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ILLINOIS POLLUTION CONTROL BOARD
NOVEMBER 10, 2009

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STATE OF ILLINOIS
Pollution Control Board

IN THE MATTER OF:	)	
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WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS FOR THE CHICAGO AREA WATERWAY SYSTEM AND THE LOWER DES PLAINES RIVER: PROPOSED AMENDMENTS TO 35 Ill. Adm. Code Parts 301, 302, 303 and 304	)	R08-9 (Rulemaking - Water)

REPORT OF PROCEEDINGS at the hearing of the above-entitled cause before Marie Tipsord, Hearing Officer, taken before Rebecca A. Graziano, Certified Shorthand Reporter within and for the County of Cook and State of Illinois, at the Bilandic Building, Room N-502, Chicago, Illinois, commencing at the hour of 1:15 on the 10th day of November, A.D., 2009.

A P P E A R A N C E S

ILLINOIS POLLUTION CONTROL BOARD:

Ms. Marie Tipsord, Hearing Officer
Ms. Alisa Liu, P.E., Environmental Scientist
Mr. Anand Rao, Senior Environmental Scientist
Mr. G. Tanner Girard, Acting Chairman
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Mr. Thomas Johnson
Ms. Andrea Moore

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY:

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MS. JESSICA DEXTER

Appeared on behalf of ELPC, Prairie Rivers Network, and Sierra Club,

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BY: MS. SUSAN FRANZETTI

Appeared on behalf of the Midwest Generation, L.L.C.,

MS. FRANZETTI: We have copied the full and complete copy of Ms. Wozniak's pre-filed testimony that you reserved with an exhibit number yesterday for us, so I wanted to give that to you.

MS. TIPSORD: We will admit Ms. Wozniak's testimony as Exhibit 364. Thank you. And I believe we're ready to go to Mr. Ettinger.

MR. ETTINGER: Yes. I am Albert Ettinger of the Environmental Law and Policy Center, and I represent various environmental groups some of the time. I'm going to start on my sheet here, and then I'm going to go through some of your testimony and the exhibits to it.

I'm going to skip question three for the time being, but I'm going to ask now about -- I'm going to ask pre-filed question five, which is on Page 3 of your pre-filed testimony. You state the changes in flow can adversely affect nest-building fish. Have nest-building fish been found in EA stream surveys?

MR. SEEGERT: Yes. The nest building species that we've found are mainly members of the sunfish family, particularly -- and I mentioned some of these earlier -- large mouth bass, bluegill,

green sunfish, pumpkinseed, and orange spotted sunfish.

And also channel catfish, which is a nest-building species that occurs occasionally -- in other words it's uncommon -- in the Upper Dresden Island Pool, and then very rarely upstream of Brandon Road Lock and dam. So that's a nest-building species, which is uncommon in the Upper Dresden Pool, and rare further upstream.

And then there are other nest-building species that include some of the darters that are rare or absent. So there are some nest-building species, mainly the sunfish and to a lesser extent the catfish, that are present, and other ones that aren't.

MR. ETTINGER: Okay. Six, how does aquatic vegetation in the Upper Dresden Pool compare to aquatic vegetation in the Illinois River?

MR. SEEGERT: I haven't studied aquatic vegetation in the Illinois River enough to be able to make a valid comparison.

MR. ETTINGER: Did you look at the aquatic vegetation that was present below Dresden Island Lock and Dam when you did the studies of the

fishery there?

MR. SEEGERT: I did, but -- I mean, I was in that section of river, but it was many years ago in that particular section. And so my recollection isn't good enough to allow for a valid comparison.

MR. ETTINGER: To your knowledge, does the temperature in the water affect the nature or species of the aquatic vegetation that would be present in the water?

MR. SEEGERT: This is just a general question? Temperature anywhere?

MR. ETTINGER: Does temperature affect the nature of the aquatic vegetation you'd expect to find in the wild?

MR. SEEGERT: I'm not an expert on aquatic macrophyte development in terms of what -- how different macrophyte -- I would just -- I would reasonably assume that there are some range of differences in the tolerance of macrophytes, just like there is in fish.

But I wouldn't know what macrophytes are or aren't tolerant. I do know from my personal observations a number of cooling lakes

that many aquatic -- strike that.

A number of aquatic plants, rooted aquatics, are very temperature tolerant, because we sample a number of places where water temperatures are in the high to mid 90s, and yet you can have good aquatic development.

MR. ETTINGER: Okay. All right. Turning now to Page 4 of your testimony, you discuss barge traffic. Are you aware as to whether there is any more barge traffic above the I-55 bridge than below?

SEEGERT: I would -- I haven't done a specific study of that, no.

MR. ETTINGER: Do you know how the -- whether there's more or less barge traffic above or below Dresden Island Lock and Dam?

MR. SEEGERT: Again, I have not investigated that.

MR. ETTINGER: Are you aware of any waterways with barge traffic that are able to support a healthy fishery?

MR. SEEGERT: I haven't specifically looked into that question. I would say, again, based on the waterways in which I've worked on, the

Mississippi River supports barge traffic. And I would say in general the Mississippi River has a healthy fish community.

Again, I haven't done a specific study that's been designed to determine attainment and non-attainment, but the studies I have been involved with on the Mississippi River I've generally found what I would call healthy fish communities. So I would say that that's a river where there is barge traffic and that sports a healthy fish community.

MR. ETTINGER: Have you looked at the Wabash River?

SEEGERT: The Wabash river does not support barge traffic.

MR. ETTINGER: The Ohio River?

MR. SEEGERT: Yes. Well, I've done a lot of work on the Ohio River. Now, the Ohio River is a good example of where you're setting the bar or ORSANCO, the Ohio River sanitation commission.

MR. ETTINGER: ORASNCO is good enough.

MR. SEEGERT: ORASNCO. ORASNCO has developed the Ohio River specific version of the IBI. The IBI is just, kind of, a family. It's a

general approach, and you try to make it specific to certain water bodies.

So they've developed a thing called ORFIN, the Ohio River Fish Index, and they, kind of, wrestled around with some of the same issues you had here. And for the most part, the ORFIN scores do meet what they believe is an appropriate index. I don't know if they've tied it specifically to an attainment, non-attainment issue.

And certainly, if you look at the fish community in the Ohio River, it is depressed compared to what the Ohio River would be without the impoundments.

MR. ETTINGER: Okay. And we agree there's barge traffic in the Illinois River below Dresden island Lock and Dam? Have you looked at that water?

MR. SEEGERT: I haven't specifically. I mean, other than the work we've done just in the very short section a number of years ago below Dresden Island Lock and Dam. So that's a very short section of river. I don't think that provides a representative picture. But I'm aware of other studies that have been done on the Illinois River,

but I have not personally been involved in those studies.

MR. ETTINGER: Okay. Now, we touched on this before, but I just want to ask the, sort of, general question. Can lakes meet Clean Water Act standards?

MR. SEEGERT: My short answer would be yes, they can.

MR. ETTINGER: Would you use the same -- how would you go about determining whether a lake was meeting Clean Water Act standards?

MR. SEEGERT: Well, that's a good question.

MR. ETTINGER: Thank you.

MS. FRANZETTI: Don't encourage him.

MR. SEEGERT: The -- and actually, there's a fair amount of research in that arena. The state that I'm most familiar with that's pursuing that is Wisconsin.

Wisconsin believes that they -- their goal is to try to come up with -- we'll just call it a lake IBI. So again, you would have obviously different metrics. But conceptually, it's the same.

In this case, I personally disagree with that. I think lakes are inherently simpler. By that, I mean in a riverine fish community, we might have to deal with 60, 70, 80 species of fish and assign it all sorts of categories. Even a fairly diverse lake is going to have 20 species of fish.

I think that in a lake situation, an experienced, professional aquatic biologist can take a look at fisheries data -- you obviously have to have data -- and look at this and say yes, this is what I expect. But it's still the same concept.

In one case, it's very structured, and the IBI says what you should expect. In the other case, it's a biologist sitting down. But I think in lakes, you can look at a lake and it's just simpler to, kind of, do the math in your head, because you don't have to deal with 80 species. You have to deal with 20 species in a lake.

MR. ETTINGER: So you would just -- you'd grade a lake without looking at the same number of species or expecting the same number of species that you would if you were grading a river?

MR. SEEGERT: Right, but you would -- the IBI really isn't anything that's new. It's just been formalized -- I mean, I've been doing this kind of work for 30 years, and in this case we always started with what do we expect, what should be there.

And so in a lake, you say, well what should be in a, quote, "good lake." And one of the studies that I was asked about before was had I done anything on lakes, or had I done anything for state agencies, and I said for the Illinois DNR, and one of the projects was to look up here in Lake County for a species called a pugnose shiner.

And I don't want to over simplify this, but I could walk to the boat landing, and in that case just, kind of, walk around and if I saw a highly diverse macrophyte community, then I would say this is a prime candidate for this species. That didn't mean the species was always there, but -- and it could do the reverse.

If what I found was no aquatic vegetation or only one kind of aquatic vegetation -- a thing called myriophyllum, which is an introduced species -- I'd say basically this lake

has been trashed. I'm not going to find a pugnose shiner. I'd, of course, still go out and look and do the investigation, but I would know -- and I'd have a very good idea.

And so you'd want to say, well what does a good lake in northeast Illinois have? Well, it should have an assemblage of what I would call lake minnows, blacknose shiner, blackchin shiner, and then the rarest of them all, pugnose shiner.

But you set up a series of expectations, and whether those expectations directly follow an IBI or they're established in the mind of the biologist is the same process that you go through, the same thought process, the same logic.

What kind of species do I expect in a good lake? I'd look at the fisheries data, and I compare what's actually found versus reasonable expectations for lakes in a particular geographic area. And if we meet those expectations, I would say yes, this is an attainment.

MR. ETTINGER: All right.

DR. GIRARD: Can I ask a quick

follow-up?

MR. ETTINGER: You're the boss here.

DR. GIRARD: Wisconsin is trying to formalize the procedure for evaluating lakes. Illinois does not have a formalized procedure at this point in time?

MR. SEEGERT: That's correct.

DR. GIRARD: Thank you.

MR. ETTINGER: What kinds of fish sampling gear does EA use?

MR. SEEGERT: I'm sorry. What kind of gear?

MR. ETTINGER: What kind of equipment do you use for fish sampling?

MR. SEEGERT: Are we talking about this series of waterways?

MR. ETTINGER: Yes, I'm sorry. Limit -- just tell me what you have used to sample this -- the waterways that you consider relevant to this proceeding.

MR. SEEGERT: Well, Mr. Vondruska's our gear guru.

MR. ETTINGER: We haven't heard enough from you.

MR. VONDRUSKA: For the long term monitoring that we've conducted for Midwest Generation and part of Commonwealth Edison, the gears that we have used every year is electrofishing -- it's three phases of electrofishing -- and we use seining. Seining consists of a six-foot by 25-foot straight seine that -- I believe it's three sixteenths-inch mash.

During the 1993 to 1995 studies, we also did gill netting with experimental gill nets. Those were six foot deep, about 125 feet long, and consisted of five experimental mesh panels ranking from a half inch square up to a three-inch square.

MR. ETTINGER: Does electrofishing catch fish below three feet?

MR. SEEGERT: Well, yes.

MR. ETTINGER: How far does it go down?

MR. SEEGERT: It depends on the species and the size of the individual, the size of the fish.

MR. ETTINGER: What would cause it to go down further?

MR. SEEGERT: Bigger fish. The bigger the fish is, the easier it is to shock. So you had something -- and I know a whale isn't a fish, but if a whale was down there we could shock him probably 40 feet down.

So big fish -- but in round numbers, we generally think that six feet -- six, seven feet is about as deep as we can get a good cross section, and sometimes, depending on the species, it might be ten feet. But six to ten feet we can be effective. Below that, we generally would not be particularly effective, we or anyone else. It's just a limitation associated with the gear.

MR. ETTINGER: Now, I'm going to display my biological knowledge here. Are larvae generally smaller than fish?

MR. SEEGERT: Yeah. Larvae are the opposite. They're opposite of the whales. They're less than an inch.

MR. ETTINGER: Right. So generally you'd been less effective at electrofishing for larvae than you would for fish?

MR. SEEGERT: Correct. You collect very few larval fish. So if you want to do a larval

fish study, such as we have done over the years, we would use specialized gears that collect larvae, because electrofishing is not very effective for fish larvae.

MR. ETTINGER: And would the seining get the larvae?

MR. SEEGERT: Joe mentioned a three sixteenth inch mesh would retain some larvae. A lot of the smaller larvae would likely pass through, and then some of it is just random. And think, basically, you have a net with a series of holes. So using my pen as an example, I have a larvae, and if it goes this way, it's going to go through the hole. If it comes this way, it's not going to go through the hole.

MS. TIPSORD: And for purposes of the record, if it goes in straight, it can go through the hole --

MR. SEEGERT: And sideways --

MS. TIPSORD: -- and sideways it would be caught?

MR. SEEGERT: That's correct. But in general, if we were doing -- wanted to use seining as a technique, we'd use what we call as a larval

seine and go down to a really fine mesh.

MR. ETTINGER: Okay. In the studies that we've done -- that you've done here, if we wanted to figure out whether or not -- what you had likely caught, we'd have to go through and figure out what techniques you would use in each case?

MR. SEEGERT: I'm sorry. What was the first part of your question?

MR. ETTINGER: If somebody wanted to go through and see if there was any, shall we say, size or depth bias in any of these collections, we'd have to go through each of these and figure out which technique you'd use?

MR. SEEGERT: I'm not sure I quite understand the question. I mean, electrofishing is considered to be a widely applied -- a gear that can be widely applied, meaning used in a lot of different places. It's going to be -- depending on depth and other factors, it's going to be more efficient or less efficient, but it's appropriate in many different circumstances.

MR. ETTINGER: I wasn't suggesting that something was inappropriate. I was just saying if I was trying to decide whether there was any bias

in terms of the size or the depth in catching -- of what you caught, I'd want to know what method you used.

MR. SEEGERT: Yes, that's correct.

MR. ETTINGER: Okay. Okay. Now, turning to Page 6 of your testimony, you speak of -- I'll just read the --

MS. FRANZETTI: Albert, this is not a pre-filed question? So do we need to go look --

MR. ETTINGER: I'm going to -- it's not a pre-filed question. "Fish species that are habit generalists, such as common carp, gizzard shad, and channel catfish, as well as pelagic species, such as emerald shiner and fresh water drum, do quite well with impounded systems.

What I want to ask you as to each of those fish is whether it is temperature intolerant.

MR. SEEGERT: Yeah.

MR. ETTINGER: And I don't want to put words in your mouth, so how sensitive are common carp to high temperatures, compared to other fish?

MR. SEEGERT: They are not temperature sensitive.

MR. ETTINGER: And how are gizzard shad.

MR. SEEGERT: Same answer.

MR. ETTINGER: Channel catfish?

MR. SEEGERT: The same answer.

MR. ETTINGER: Channel catfish are not temperature sensitive?

MR. SEEGERT: Not in the spectrum of, you know, from trout and one end and carp close to the other end. But they're closer to the nonsensitive end than the sensitive end.

MR. ETTINGER: Well, would channel catfish be less sensitive than carp -- I'm sorry -- more sensitive than carp?

MR. SEEGERT: To temperature?

MR. ETTINGER: Yes.

MR. SEEGERT: They're -- just going on my recollection, I would say they're close, but they're slightly more sensitive -- or slightly -- yeah, slightly more sensitive than carp.

MR. ETTINGER: If you wanted to look that up, what would you look at?

MR. SEEGERT: There's various compilations that list upper lethal temperatures.

And certainly in some of the documents that Mr. Yoder provided, he has such lists. So I'd go to a list like that. Not necessarily his list, but a list like that.

MR. ETTINGER: Where would you put emerald shiner on the scale?

MR. SEEGERT: Well, for warm water -- and again, for the Board's -- to clarify, we're not -- we're talking here only about warm water fish, because this isn't a cold water system. It doesn't have trout and salmon, and it's not a cool water system. So within the warm water spectrum of fish, it's one of the more sensitive species of warm water fish.

MR. ETTINGER: And where would fish and freshwater drum fit into that?

MR. SEEGERT: They're kind of in the middle. They're middle to high. In other words, they're fairly temperature tolerant. Probably not as tolerant as carp, but they're near the highest end of that spectrum.

MR. ETTINGER: And where are gizzard shad relative to carp?

MR. SEEGERT: Gizzard shad are less

sensitive, but they're at the high end of the spectrum.

MR. ETTINGER: High end of the tolerance spectrum?

MR. SEEGERT: Yes. They have a fairly high upper lethal temperature.

MR. ETTINGER: Now, getting to question -- no, let's do something else first.

On Page 7, you say no one has seriously suggested that navigational use in the CAWS would be discontinued in the foreseeable future. Are you aware of the report by the --

MS. FRANZETTI: Can you -- Albert, I'm sorry. Can you give him just a second?

MR. ETTINGER: It's the very last line on Page 7.

MS. FRANZETTI: Page 7. Okay.

MR. SEEGERT: Okay.

MR. ETTINGER: Are you aware of the recent report by the Alliance for the Great Lakes on the -- that suggest that that system should be closed to keep invasive species from traveling through the system?

MR. SEEGERT: I'm generally aware that

the -- that some people have suggested that there should be a disconnect between Lake Michigan and the Ship Canal. I'm not familiar with the specific report that you're citing.

MR. ETTINGER: And you don't know whether they were serious or not?

MR. SEEGERT: No, I don't.

MR. ETTINGER: Okay. Have you -- on Page 6 of your testimony, you state that you discuss the Fox River and, for example, extensive studies of the nearby Fox River, funded in part by U.S. EPA, documented significant and widespread adverse impacts on the aquatic communities due to the effects of the impounding.

And then we see Exhibit 2, Attachment 3. The first question is easy. Is Exhibit 2, Attachment 3, this paper by Victor Santucci, Steven Gerhart, and Steven Pescatelli?

MR. SEEGERT: Yes, it is.

MR. ETTINGER: Okay. On Page 988 of that study -- I supplied a copy. There's not actually 988 pages in the record, we'll all be happy to hear -- it states in the bottom of the left column, "Phosphorus and nitrogen loading from

numerous potential sources, for example, municipal wastewater treatment plants, fertile native and bed material, agricultural fertilizers, and non-point urban runoff, has made the Fox River below Elgin, Illinois, among the most enriched rivers in the Midwest."

"In combination with the presence of numerous impoundments, high nutrient input has created an environment that supports successive algal growth. Daily cycles of photosynthesis and respiration by abundant algae, in turn, produce large fluctuations of DO and PH that often resulted in substandard water quality conditions and impoundments."

Are those conditions and the phenomena that Mr. Santucci and others found in the Fox River present in the Lower Des Plaines?

MS. FRANZETTI: Counsel, when you say other phenomena?

MR. ETTINGER: Is the phenomena that I discussed of nutrients combined with impoundments causing diurnal flux and other problems that are discussed in this report -- I don't want to read the quote again -- present in the Lower Des Plaines?

MS. FRANZETTI: Well, my point is only -- and you just did it again -- when you go beyond what you just read --

MR. ETTINGER: I'm not going beyond --

MS. FRANZETTI: -- and say other problems in this report.

MR. ETTINGER: The other problems discussed in the reading that I made.

MR. SEEGERT: We have not specifically looked at the nutrient issue in the Upper Dresden island Pool or in the Chicago Sanitary and Ship Canal. I do know that there are or can be some fairly large fluctuations in the old values that presumably would be a result of this -- the daily cycle that you're referring to.

MR. ETTINGER: When you say we, do you mean EA?

MR. SEEGERT: EA. So we have seen DO values that -- well, we've seen -- let me rephrase that.

I don't know if we've done any work at night, so we don't know what the DO values are at night. But we have seen highly elevated levels during the day, indicating a lot of

photosynthesis going on. So we have -- we've observed part of the cycle. We've observed high dissolved oxygen concentrations at some locations during the day.

MR. ETTINGER: So you don't know whether the factor that is pointing to in this paper is also present in the Lower Des Plaines or not?

MR. SEEGERT: No, I do not.

MR. ETTINGER: Going back to pre-filed question number seven, what are the potential causes of fish abnormalities?

MR. SEEGERT: Fish abnormalities are caused by stress, disease, and toxicants, particularly those toxicants that are in sediment.

MR. ETTINGER: What kind of diseases do fish get?

MR. SEEGERT: Well, can you be more specific?

MR. ETTINGER: Well, I asked a general question because you gave a general answer. One of the things that could be caused -- cause abnormalities was disease. So what kind of diseases would cause abnormalities in fish?

MR. SEEGERT: Yeah, they can get

tumors. They can get cancerous tumors, for example. They can get various internal disease, they can get bacterial kidney disease.

Now, you would not detect that by any kind of external examination, but there's a whole host of things that they can get. I guess what -- let me modify my answer a little bit. I was -- I think my answer applies mainly to that subcategory of anomalies that we were talking about as the DELT anomalies.

There's another whole group of things that are just sort of the normal -- like a black spot. And there's other things that are -- little worms and flukes that the fish get that are part of a various life cycle where herons ingest the fish, and the thing goes in the heron and it comes out in the heron poop, and so on and so forth, and it goes back around in a circle.

Those aren't the kind of -- and those are, kind of, normal things that fish get. I'm talking about the abnormalities that have been directed by -- directly related to poor fish communities, and that's this subcategory of abnormalities called DELT, the deformities,

erosions, lesions and tumors.

MR. ETTINGER: Let me limit my question now to DELTs. And would your answer be the same, stress causes DELTs?

MR. SEEGERT: Yes.

MR. ETTINGER: And disease causes DELTs?

MR. SEEGERT: Yes.

MR. ETTINGER: Okay. What kind of disease causes DELT?

MR. SEEGERT: I don't know what kind of disease causes DELT.

MR. ETTINGER: Okay. Does -- do parasites cause DELT.

MR. SEEGERT: Generally no. As a matter of fact, Mr. Vondruska may be able to amplify on this. They specifically -- Ohio EPA -- they have a lot of things -- they have a lot of protocols to look at, and they have one specifically for measuring DELT, and they specifically -- when you're talking about lesions, basically you've got an area on the fish where they've got a cut or some bare skin.

And they specifically say do not

include areas where there might have been anchor worm, which is a parasite. So they don't consider a wound caused by an anchor worm to be a DELT anomaly. That goes more into the just general anomalies. It's not a DELT anomaly.

Joe, do you have anything to add on that?

MR. VONDRUSKA: No. That's correct, you have to be careful looking at the lesions to make sure it's in the --

MR. ETTINGER: Would fungal growth be a DELT anomaly?

MR. VONDRUSKA: Fungal growth, not -- no.

MR. ETTINGER: Do fish have -- do fish get fungal growth?

MR. VONDRUSKA: Sure. Now, getting back to -- you had another question regarding DELTs. I believe Ohio EPA's manual refers to flexi-bacteria as causing, like, fin erosion.

MR. ETTINGER: So flexi-bacteria does count for DELTs, but not other --

MR. SEEGERT: Well, it's the -- it's the end result. The flexi-bacteria caused the fin

to be eaten away. So what you're measuring in the DELT is fin erosion. Basically that bacteria is literally eating away at that fin, and flexi-bacteria are one of the things that can cause fin erosion.

MR. ETTINGER: And what causes flexi-bacteria?

MR. SEEGERT: My understanding --

MS. FRANZETTI: If you know.

MR. ETTINGER: You can always say I don't know.

MS. FRANZETTI: Right.

MR. SEEGERT: Flexi-bacteria are in the water. I think they're always there. And then when fish get stressed, their immune system gets refused and the flexi-bacteria are able to grab hold.

Basically, other things are reducing their immune system, and so it's not just flexi -- that's one -- flexi-bacteria, that's just one example they give. Anything that basically really stresses out, you know, the fish seriously.

MR. ETTINGER: Okay. Along with Pollution Control Board hearings?

MR. VONDRUSKA: Well, but more specific for fish, you talked about some of the nest-builders. You know, some of the nest-builders, when they're building their nest, they can cause -- you know, they hurt their fins when they're doing that, and flexi-bacteria can attack it, which leads to fin erosion and sometimes form fin rays.

MR. ETTINGER: And can stressors add on to each other? If a fish was facing a challenge, like a high ammonia, would having a low dissolved oxygen level make it less likely to do well?

MR. SEEGERT: I don't know that anyone has specifically looked at what, if any, synergistic interactions there might be between the various factors. Just stress in general causes a problem, whether it's purely additive -- there also may be some that are antagonistic, but I don't think anyone has investigated that closely enough to say how they interact.

MR. ETTINGER: So if there's a lot of aspirin in the water that might relieve stress?

MR. SEEGERT: Right, yeah. And on the other hand, if they're worried about foreclosure or loss of job, that might increase their stress level.

MR. ETTINGER: Okay. All right. Looking now at the document that was Attachment 1 -- I hope that's Attachment 1 -- Detailed Summary of EA Engineering Science and Technology Stream Surveys for the Upper Illinois Waterway, 1993 to 2006. I'm just making sure I read this right. You've got mean IWB mod.

MR. SEEGERT: Sir, where are you reading from?

MR. ETTINGER: I'm sorry. I'm on Page 5. We've discussed this concept somewhat before I think. I just want to make sure I understand it in context. So the mean IWB mod, an index of what the fish community health scores were, and then you have numbers for Lockport?

MR. SEEGERT: Yes.

MR. ETTINGER: What is the scale that goes on?

MR. SEEGERT: Well, it's a log scale. So in theory, you could get -- I don't know that there's any absolute upper end. I mean, if you caught one million fish, you'd get a very high number. But in a practical sense, about the highest value I've ever seen is about an 11.

MR. ETTINGER: Now, I forget, you said below that, 5.2 and 5.3 are poor, and 6.5, at least, is fair, according to this sheet. Where do those ratings come from?

MR. SEEGERT: Well, in the last full sentence -- well, the sentence immediately above the scores that you're referring to says using IWB mod criteria established by Ohio EPA. So we're using their criteria, so it came from -- the cutoffs came from Ohio EPA.

MR. ETTINGER: Okay. We went over some of this before. Was that the criteria that they developed after they decided they couldn't use the IBI stores for nonweightable streams?

MR. SEEGERT: By they?

MR. ETTINGER: Meaning Ohio EPA.

MR. SEEGERT: Ohio EPA?

MR. ETTINGER: Well, let's --

MS. FRANZETTI: Counsel, is the question is the IWB mod criteria something they developed after they decided --

MR. ETTINGER: Well, why don't I just drop -- what's your understanding of the development of the IWB mod criteria?

MR. SEEGERT: It preceded the IBI that the IBW -- not the mod version. IWB was developed around 1970 by Dr. James Gamon during his work on the Wabash River. And then Ohio EPA -- Mr. Yoder was a former student of Dr. Gamon. So he learned it from Dr. Gamon.

When Mr. Yoder went to Ohio EPA, he thought this would be an appropriate thing to use at my Agency, and so they started using it in its unmodified form, and then at some point they decided it was -- it should be modified, which they did, and then also at or around that same time was when the IBI was coming out.

So now, in most water bodies, Ohio EPA uses both of those indexes to -- for fish to determine detainment. They use both IWB mod and the IBI.

MR. ETTINGER: Does EA use IB -- whatever it is?

MS. FRANZETTI: B?

MR. ETTINGER: B mod. Does EA use it?

MR. SEEGERT: Use it as compared to the IWB? Or, I mean, what --

MR. ETTINGER: Do you use either of

them?

MR. SEEGERT: Yes, yes.

MR. ETTINGER: Okay. Do you think they're a sound methodology for assessing the health in the aquatic community?

MS. FRANZETTI: And Albert, both IBI and IWB mod, or IWB and IWB mod?

MR. ETTINGER: Why don't you --

MS. FRANZETTI: What's included in the question?

MR. ETTINGER: Everything she said.

MS. FRANZETTI: I got to shut up.

MR. SEEGERT: We generally do not use -- I guess the word is -- rely on the IWB. Because in its original form, it did give too much credit for highly tolerant fish. So we generally don't use that.

We use the IWB mod, which consists of taking -- I think it's 13 species of highly tolerant fish -- and excluding them for most of the IWB calculations. So that's what the modification is. It just takes out highly tolerant fish.

So we use that regularly on the Ohio River and a number of other places. We think

it's -- you know, it's a decent method. The IBI, assuming there's, again, what I would call a calibrated version available, I think overall is somewhat better. I think it's more robust. I guess that would be a way of describing it.

So the IWB mod isn't bad, but I think the IBI is a little bit more sensitive to -- it provides better resolution on determining the health of the fish community.

MR. ETTINGER: Has EA engineering done an analysis of the Brandon and Dresden Pool using MWB mod analysis?

MR. SEEGERT: Well, that's what -- maybe I'm misunderstanding the question. That's what we did in this case.

MR. ETTINGER: Okay.

MS. FRANZETTI: Referring to Page 5?

MR. SEEGERT: Page 5 of Attachment 1. I mean, these are scores that we calculated using the data that we collected from the system following the Ohio EPA modified IWB scoring instructions, and these are the numbers we came up with. And then based on where they put the different categories, we said very poor, poor, or fair for the different

segments.

MR. ETTINGER: What exhibit are we up to now?

MS. TIPSORD: 367.

MR. ETTINGER: I'll show you --

MS. TIPSORD: Because Susan hasn't been keeping up with Fred.

MS. FRANZETTI: I'm a slacker.

MR. ETTINGER: 367.

MS. TIPSORD: No, this will be 368.

MR. ETTINGER: Oh, 368. I'm sorry.

MS. TIPSORD: I've been handed EA Project 61393.26, Development of Biologically Based Thermal Limits for the Lower Des Plaines River, prepared for Midwest Generation, Chicago, Illinois, Prepared by EA Engineering Science and Technology. August 2007 is the date.

MS. FRANZETTI: And Counsel, I'll note right off the bat, I will object to any questioning that deals with thermal standards or limits at this time.

MR. ETTINGER: I couldn't agree more. In fact, I don't like documents about that nearly as much as I like other parts of the document.

MS. TIPSORD: Well, let me finish. If there's no objection, we will admit this as Exhibit 368.

MS. FRANZETTI: No objection to its admittance, just an objection as to the scope of the questioning at this time.

MS. TIPSORD: And I will entertain those if they should arise. With that, I'll mark it as Exhibit 368.

MR. ETTINGER: Okay. I'd like now to look at -- I guess it is Figure 1 -- which is -- it's after Page 16 -- and ask you -- well, first of all, did EA do this?

MR. SEEGERT: Yes.

MR. ETTINGER: Who specifically did that work for EA?

MR. SEEGERT: I believe this was mainly a combination of myself and Mr. Vondruska.

MR. ETTINGER: Okay. Now, these -- if we just look at the upstream I-55 bridge numbers here, does the -- I'm not quite sure how to read these. These aren't river miles? Or what are the units at the bottom here from 402 to 408?

MR. SEEGERT: Those are location

numbers that he established.

MR. ETTINGER: And how do they correspond to river miles? Is there some way to determine that?

MR. SEEGERT: There's no direct correlation, no.

MR. ETTINGER: Does it correlate to something that goes on with your QHEI data collection?

MR. VONDRUSKA: Well, the sampling location is listed at the bottom. We have -- for every annual report, we have a list of sampling locations which provide the river miles and how the location was sampled.

MR. ETTINGER: All right. So we'd have to figure that out. We've got some other document that shows the sampling locations. Perhaps they're in the record, perhaps not.

MS. FRANZETTI: I don't know that we have it in this proceeding that would exist within EA's records.

MR. VONDRUSKA: Well, sure. Part of AS 96-10, the sample location designations are the same.

MR. ETTINGER: Would it help -- but I am reading this probably, that this 402 number is the most upstream sampling location, and the 408 is the most downstream sampling location within that Pool?

MR. VONDRUSKA: Within upstream I-55 segments?

MR. ETTINGER: Yes.

MR. VONDRUSKA: Correct.

MR. ETTINGER: Okay. And to figure out exactly where that was, we'd have to go in and look at your sampling location information --

MR. VONDRUSKA: Yes.

MR. ETTINGER: -- so we can find that?

MR. VONDRUSKA: Yes.

MR. ETTINGER: And you believe it's from a document that's already in the record?

MS. FRANZETTI: No, no. Actually, I think not.

MR. ETTINGER: Okay.

MS. WILLIAMS: What about one of the attachments -- I want to say maybe M.

MS. FRANZETTI: I think this goes --

MS. WILLIAMS: MM would be one of EA's

annual reports of Midwest Generation's annual reports. Would it be contained within --

MR. VONDRUSKA: I don't have my glasses today. I'm sorry.

MS. TIPSORD: Yeah. Attachment MM to the proposal is 2004 Lower Des Plaines River Fisheries Investigation, River Mile 274.4 through 285.5 EA Engineering, et cetera.

And you had mentioned before they're in the annual report, so we can look at that document and correlate where these are located.

MR. VONDRUSKA: Yes.

MR. ETTINGER: Do any of our -- are any of your sample locations in the discharge canal from the Joliet plant?

MR. VONDRUSKA: Yes, location 403.

MR. ETTINGER: 403 is actually inside the discharge canal, or --

MR. VONDRUSKA: Yes.

MR. ETTINGER: Okay.

MR. VONDRUSKA: Actually, specifically there's 250 meters within the Joliet 9 discharge canal, and 250 meters within the Joliet 29 discharge canal until you have about a 500-meter zone.

MR. ETTINGER: Do you measure at the end of the canal or top of the canal?

MR. VONDRUSKA: Measure what?

MR. ETTINGER: Whatever you're measuring. Is your location at the end of the canal or up at the discharge point?

MR. VONDRUSKA: It starts at the upstream end. For example, the location, specifically Joliet Station 29, Units 7 and 8 discharge canal, we start upstream in it, and we end above the discharge for the cooling towers. Joliet 9 -- okay.

MR. ETTINGER: Okay. I'm --

MR. VONDRUSKA: You were asking where we sample this.

MR. ETTINGER: Yeah. I'm just trying to figure out where the samplers is in relation to the actual discharge point.

MS. FRANZETTI: Well, what are you defining as the actual discharge point?

MR. ETTINGER: The place where the water comes out.

MS. FRANZETTI: Where it meets the river?

MR. ETTINGER: Yes.

MS. FRANZETTI: Where the end of the canal meets the river?

MR. ETTINGER: That's what I'm asking. Are you measuring it where the end of the canal meets the river, or at some other site?

MR. VONDRUSKA: Well, I guess I'm a little bit confused.

MS. TIPSORD: I am, too, because your question was do you measure in the canal. Now you've changed the question.

MR. ETTINGER: Well, maybe I have. Just where do you measure with regard -- is this at the hottest point or at the cooler? Where is it gotten?

MR. VONDRUSKA: What am I measuring here?

MR. ETTINGER: Yeah, exactly.

MR. VONDRUSKA: Specify that.

MS. TIPSORD: Let me try it, Albert. You just identified 403 on Exhibit 368 at whatever page that number is --

MS. FRANZETTI: Figure 1.

MS. TIPSORD: -- Figure 1 as

being -- measuring temperature in the canal. Is that within the canal itself?

MR. VONDRUSKA: Or measuring temperature, yes.

MS. TIPSORD: Or is it where the river meets the canal?

MR. VONDRUSKA: No, it's within to the canal, close to the discharge.

MS. TIPSORD: Close to the pike?

MR. VONDRUSKA: Yes.

MS. TIPSORD: Thank you. Since we just defined the discharge as being lengthy -- so the 403 is within the canal close to the pipe. Thank you.

MR. VONDRUSKA: But in terms of the fish sampling -- that's why we're measuring a physical chemical parameter, such as the ones where you measure water temperature or dissolved oxygen, or if we're measuring the, quote, unquote, "Fish community." That's where I was confused.

MS. FRANZETTI: Is that a different location than where you measured temperature?

MR. VONDRUSKA: Well, again, it's 250 meters that we sample in each discharge canal

for electrofishing, and those get combined into a 500-meter sample.

MR. ETTINGER: So am I to understand then that the -- there's enough of a fish community that's actually in the discharge canal that it scores a 5.5 here?

MR. VONDRUSKA: I can't tell what it scored, but yes, there is enough in the fish community.

MR. SEEGERT: About that, yes.

MR. ETTINGER: Okay. And then what's 403A?

MR. VONDRUSKA: 403A represents a sample downstream of the discharge canal.

MR. ETTINGER: I'd like to turn above -- we're going to be very careful as to the portions we read here to avoid the objections.

MS. FRANZETTI: Thank you.

MR. ETTINGER: On Page 7, it states, "Below 65 Farenheit and above 85 Farenheit --

MR. SEEGERT: I'm sorry. Where are --

MS. FRANZETTI: Albert, I'm sorry. But there's a lot of Page 7. Can you get us to --

MR. ETTINGER: Well, the last full

paragraph. I'll just read the whole -- well, I can't read --

MS. FRANZETTI: The paragraph that begins, "As can be seen?"

MR. ETTINGER: As can be seen, yes.

MR. SEEGERT: Okay.

MR. ETTINGER: "The lowest procedure also yields a basically inverted U curve. For species richness, the lowest procedure indicates that richness is a similar cause of a fairly broad temperature plateau from about 65 Farenheit to 85 Farenheit."

MS. FRANZETTI: 87.

MR. ETTINGER: 87, sorry. Figure 6, "Below 65 Farenheit and above 87 Farenheit, richness appears to decrease. To determine at what temperature species richness was reduced significantly, richness at various high temperatures was compared to richness at a .72 degrees Farenheit, representative of the plateau."

Because -- well, we can all read the rest of the paragraph here. Well, maybe I'll put it in the record. "Because multiple sequential comparisons were made, a P value of 0.01 was used to

determine significance. It was found that richness was significantly lower at 90 degrees Farenheit."

I'm going to ask first about the P value. What does that mean?

MR. SEEGERT: Well, that's the probability. The probability that the result that you get -- and I'm not answering now as a statistician, but as a biologist -- but it's the probability that -- the difference that you see is just random, just by chance. So when you get down to the low probabilities, you say, "I don't think this is a real difference." It's because the chance gets so low.

MR. ETTINGER: So there's basically only a four percent chance that the difference between 89 and 72 is chance?

MR. SEEGERT: Well, again, I don't think it's quite that simple in this case, because of it being sequentials -- and we worked with an outside biostatistician -- I guess I'd call it pretty high-powered stuff beyond my expertise on the statistic side of things.

So we went to an outside biostatistician, and his -- we did what his -- what

he said, which is in this case, because you're making multiple sequential comparisons, that you want to use work at a .01 level. And so that's what we did. When you get down to 90, then it goes below .01.

MR. ETTINGER: Well, we're all fortunate that that statistician is not here today, so I won't be able to ask him any questions, and I'll just have to go on. Thank you.

MR. ANDES: How long are we going on for?

MR. ETTINGER: Oh, I don't know. Half an hour maybe. You can leave.

MR. ANDES: No, I can't.

MR. OTTO: Are you going to use any of your pre-filed questions?

MR. ETTINGER: I will eventually. I've used a lot of them.

I'd like to look at -- these are very pretty.

MR. SEEGERT: I agree. I like them.

MS. FRANZETTI: For the record?

MS. TIPSORD: For the record?

MR. ETTINGER: For the record -- well,

I'm not quite sure what they are.

MS. TIPSORD: What is very pretty?

MR. ETTINGER: That was going to be my next question. What are these?

MS. FRANZETTI: I think they have a title.

MR. ETTINGER: But I will say it's listed as Attachment F, figures showing QHEI score distributions for the July 2005 study. So I believe that's Attachment 2F to Greg Seegert's testimony. Is that correct?

MR. SEEGERT: Yes.

MR. ETTINGER: Okay. What, in general, are these pretty things?

MR. SEEGERT: Okay. These are a graphical representation of the various QHEI scores that we measured during our 2008 -- July of 2008 survey. And for ease of comparison, I broke -- we broke -- Mr. Vondruska and I worked on this together -- broke this into categories.

Basically we were asking the question how much good habitat is out there, habitat that everyone would pretty much agree should support aquatic life -- Clean Water Act aquatic life goals,

and that was anything above 60.

We heard a lot of testimony about -- there's this, kind of, gray area in between, which is 45 through 59. And then depending on the specific circumstances, an area that had a habitat score within that range may or may not obtain, and then pretty much everyone was in the green. Then when you get to 45 or below, habitat is poor, and you're most likely not going to attain.

So we want to put things just in a simple three color system that said how much of this area is good, how much is fair, and how much is poor. And we were also able to -- this, I guess, stippled or cross hatched area in the center represents the river channel.

So that -- the width of this figure, think of this as the actual channel. It's obviously, kind of, stylized, but this represents the width of the channel at any particular point. And then based on where the actual river channel started, that's how far from the shore -- out to where the navigation channel started, that's where we did our QHEIs.

So the stippled area in the

center, represents where we did not do a formal QHEI. And the take home message I get from this is that green is good. There's almost no green on this map.

MR. ETTINGER: Well, let's ask about that. First of all, the boats seem to be having to take a very sharp turn at mile 283. Is that because of the style, or what happened?

MR. SEEGERT: No, it's because the channel -- the navigation channel changes.

MR. ETTINGER: Okay.

MR. VONDRUSKA: It makes a big bend.

MR. ETTINGER: All right. And so if we look at green is good and yellow is fair, it looks like we have -- what, we have green at the top, and we have yellow at about mile 280 down?

MR. SEEGERT: Well, from 280 to 279.

MR. ETTINGER: And that's Figure 2 F-A -- I'm sorry -- 2 F-1. And in using the modified scores, we get the same picture basically?

MR. SEEGERT: Well, his --

MS. FRANZETTI: Albert, I think, just mentioned a different figure number for the modified

scores.

MR. ETTINGER: Yes. Figure F-2 is the narrative habitat classification based on MBI modified QHEI scores.

MR. SEEGERT: Correct. So those are the scores based on what Mr. Yoder testified to were -- was the more appropriate, because they took into account the impounding of the river. So I would take this to be the more accurate representation.

MR. ETTINGER: Okay. Now, where does the impounding stop in this chart?

MR. SEEGERT: At -- basically where the green ends.

MR. ETTINGER: Okay. So we don't have to make an -- we don't have to make an adjustment to that portion of the pool under the modified --

MR. SEEGERT: It's good under both cases, because it's not modified. So the adjustment for modification doesn't come into play at all.

MR. ETTINGER: So there's no --

MR. SEEGERT: I'm sorry. Well, I'm talking about modified as referred to -- MBI modified their technique based on impoundment or

not -- based on the area as being impounded.

So because in this area the tail waters were not impounded, they didn't -- it doesn't make any difference whether you use the modified version or the unmodified version.

MR. ETTINGER: Okay. Have you ever studied the temperatures above the Joliet plant and below the Brandon Road Lock and Dam?

MR. SEEGERT: I'm sorry. What area?

MR. ETTINGER: Well, the green area we were talking about there. Have you looked at the temperatures specifically in that area?

MR. SEEGERT: We measured temperature in conjunction with all the biological collections that we made. So I would say yes.

MR. ETTINGER: Based on that study, are the temperatures higher or lower than the temperatures below the Joliet plant?

MR. SEEGERT: I'm not sure I can answer that. Joe, can you?

MR. VONDRUSKA: The Brandon tail waters compared to downstream of the plants?

MR. ETTINGER: Yes.

MR. VONDRUSKA: You know, I guess in

general most of the times it's higher downstream of the plants, but there's times when it's similar.

MR. ETTINGER: Have you -- you've heard of heat attracting fish during the winter?

MR. SEEGERT: Yes.

MR. ETTINGER: How does that work?

MR. SEEGERT: Fish are attracted to heat.

MR. ETTINGER: And they swim miles upstream in order to be warm?

MR. SEEGERT: They might swim a few miles. Well, they have to be able to detect it. If there's a fish that's outside any temperature grading, then it has no way of knowing that it's warm up there. So if they can detect a temperature gradient, then they could follow that for some distance.

MR. ETTINGER: Does heat affect the toxicity of any pollutants?

MR. SEEGERT: I don't believe I can answer that question.

MR. ETTINGER: Do you know of any relationship or lack of relationship between heat and fungal diseases?

MR. SEEGERT: I don't know the answer to that either.

MR. ETTINGER: How do -- does the temperature affect the time at which fish eggs hatch?

MR. SEEGERT: Yes.

MR. ETTINGER: Is temperature one of the things that causes the fish to know when to do their thing?

MR. SEEGERT: Fish are going to respond to temperature as a general queue so that all other things being equal -- and that's a big assumption. But if everything else is exactly equal, then when temperatures are warmer, either because of a heat input or just naturally sometimes you get a warm spring versus a cool spring, then the time at which spawning occurs will be adjusted somewhat.

It doesn't -- you know, there's a limit. You're not going to have something spawn three months ahead of time, but it might span a week or two ahead of time than under cooler circumstances.

MR. ETTINGER: Have you ever

calculated the QHEI scores from Hickory Creek, Jackson Creek, Prairie Creek, or any other tributary into the Lower Des Plaines?

MR. SEEGERT: Now, is this a pre-filed question?

MR. ETTINGER: It actually is.

MR. SEEGERT: Wow.

MR. ETTINGER: I wanted to please whoever in the audience was asking.

MS. FRANZETTI: Number 24. He just doesn't like to tell you when it is.

MR. SEEGERT: Okay. We calculated QHEIs for the tributary mouth locations we sampled. Specifically, that means Jackson Creek, Grant Creek, and the Upper Des Plaines River. But except for the Upper Des Plaines, we do not sample any of the free-flowing areas of the tributaries because we're interested in conditions within the river, not in its tributary.

So we don't really think that -- contrary to what Ms. Barghusen stated during her testimony, we don't believe that the areas depend on one another. The tributaries don't have a big effect on what's going on within the main stem

of the river and vice versa.

MR. ETTINGER: Okay. Let's ask 27. Why is it that darters and redhorse are sometimes found in the Upper Dresden Pool?

MR. SEEGERT: Well, they're found there occasionally, but never in large numbers, and they're never found in large numbers because the habitat is suboptimal for both groups.

MR. ETTINGER: Where is his resume?

MS. TIPSORD: Exhibit 1 to Attachment 36.

MR. ETTINGER: Yes. In -- let's wait on that. Sorry. It's fine, but we'll get to talk to you again probably later. I think we're done.

MS. TIPSORD: All right. Are there any other questions for Mr. Seegert? All right. Seeing none, let's go off the record for just a couple seconds.

(Whereupon, a discussion was had off the record.)

MS. TIPSORD: Our next set of hearings will be January 13th and 14th. As I said, we have a Clean Air act rule that will take up the only availability in December, and we are going to be

sandwiched in between the Clean Air Act rules on January 13th and 14th, at which time we will talk to Dr. Burton. If we can get done on the 13th, wonderful. If not, I will do a hearing officer order that resets the room and reiterates that it's Dr. Burton.

Thank you again tore your patients, your time, and everybody have a safe trip home.

STATE OF ILLINOIS)
) SS
COUNTY OF COOK)

REBECCA A. GRAZIANO, being first duly sworn on oath says that she is a court reporter doing business in the City of Chicago; that she reported in shorthand the proceedings given at the taking of said hearing and that the foregoing is a true and correct transcript of her shorthand notes so taken as aforesaid and contains all the proceedings given at said hearing.

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SUBSCRIBED AND SWORN TO
before me this 19th day
of November, A.D., 2009.

Kimberly A Meeks
Notary Public

NOTARY PUBLIC OFFICIAL SEAL STATE OF ILLINOIS
KIMBERLY A. MEEKS
MY COMMISSION EXPIRES
NOVEMBER 30, 2011

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